REMARKS

The Office Action mailed January 20, 2004, has been received and reviewed. Claims 1 through 7, and 10 through 25 are currently pending in the application. Claims 1 through 7, and 10 through 25 stand rejected. Claims 16 through 25 have been objected to. Applicants have amended claims 1, 7, 16 and 23, and respectfully request reconsideration of the application as amended herein.

Objections to Claims 16 through 25

Claims 16 through 25 stand objected to because of the informality that the claim limitation of "creating new data mining functions" is not found in the specification or drawings. Applicants have amended claim 16 accordingly. Applicants respectfully assert that independent claim 23 lacks such terminology. Applicants respectfully request that the objection be withdrawn.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,430,547 to Busche et al. in view of U.S. Patent No. 6,026,399 to Kohavi et al.

Claims 7, 10, 11 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Busche et al. (U.S. Patent No. 6,430,547) in view of Kohavi et al. (U.S. Patent No. 6,026,399). Applicants respectfully traverse this rejection, as hereinafter set forth.

> M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:
>
> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 7, 10, 11 and 15 are improper because the elements for a prima facie case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art references must teach or suggest all the claim limitations.

Claims 7, 10, 11 and 15

The Office Action alleges that:

> Busche discloses a system including one or more spatial databases corresponding to one or more spatial environments, a system for knowledge discovery from the one or more spatial databases, the system (Fig 4; col 2, lines 19-21; col 6, lines 10-15) comprising: spatial data modeling and analysis module (SDAM module) for extracting knowledge from the one or more spatial databases (Fig 4; col 13, lines 25-30, 35-40), the SDAM module comprising:
> a data inspection module for providing spatial statistics on the loaded data set (col 4, lines 53-55); (Office Action p. 8, emphasis added).

Applicants respectfully disagree with the characterization of the alleged teachings of Busche. A careful reading of the Busche reference discloses that the Busche "data processing system" (Brief Description of the Drawings referencing Fig. 4) illustrates separate subsystems, namely Spatial Analysis Subsystem 412 and Data Mining Subsystem 410 (Busche Fig. 4). The citations in the Office Action, namely, Busche at column 13, lines 35 through 40, apparently relate to Applicants' claim element, "spatial data modeling and analysis module (SDAM module)," to the Busche reference's "spatial analysis subsystem 412" which, according to Busche, "receives relationship data from data mining subsystem 410 for plotting and displaying spatial relationships and may return feedback information concerning spatial relationships to data mining subsystem 408." According to Applicants' claim 7, Applicants' "SDAM module compris[es]: . . . a data inspection module for providing spatial statistics on the loaded data set;". The Office Action cites to Busche at column 4, lines 53 through 55, for disclosure of Applicants' claim element. The Busche reference at column 4, lines 53 through 55, specifically discloses ". . . intelligence, and parallel/distributed computing. Data mining may be categorized into several tasks, such as association, classification, and clustering." Applicants respectfully

disagree that such a broad statement discloses Applicants' claimed element, and certainly cannot be read to disclose Applicants' claimed element in as complete detail as contained in the claims. Therefore, Applicants respectfully request that the rejection be withdrawn.

Regarding Applicants' element of a **"data partitioning module for dividing the data set into a training set and at last one modeling set wherein the dividing is selected from the group consisting of: dividing such that the training set comprises a substantially homogenous spatial relationship to the at least one modeling set, and dividing such that the training set comprises a substantially separate spatial relationship to the at least one modeling set"**, the Office Action, at pages 8 through 9, alleges that Busche discloses the same at column 7, lines 10 through 15 and column 10 lines 40 through 55. Applicants respectfully disagree about the characterization of the teaching of Busche. For clarity, Applicants have reprinted the specific citations to the references below to highlight that such claim elements are not disclosed by Busche as alleged by the Examiner. Specifically, Busche teaches at the cited references:

> For example, given a particular type of rock and concentration of an element in which the tuple value is not known, if among the 20 nearest neighbors, 15 samples showed a particular chemical signature and S samples did not, then it might be predicted that the value of this new tuple would be "has chemical signature A". This technique does not discover any new rules, but it does provide an explanation for the classification, namely the values of the closest neighbors. (Col. 7, lines 10-15).

> . . . because no veins of that type had been seen in these rocks in the past.
>
> Spatial analysis allows for the relative locations of these data to be addressed. An oil company may collect significant amounts of data using a variety of well-logging instruments in which a well is drilled, an instrument is lowered into the well, and the instrument is slowly pulled to the surface while data is collected from the instrument. The company may collect data throughout a region by drilling several wells in a region. With a scarcity of data in certain subregions, a modeling tool provides some predictive capability to the known values by creating intermediate values. Using different types of spatial analysis techniques, values between the wells may be predicted, and a three-dimensional model of the region that shows various characteristics in the data may then be constructed in order to predict unknown values between the known values. (Col. 10, lines 40-55).

Applicants respectfully point out that nothing within Busche, as cited by the Examiner, discusses the specific element of Applicants' invention, namely:

> a data partitioning module for dividing the data set into a training set and at least one modeling set wherein the dividing is selected from the group consisting of:
> dividing such that the training set comprises a substantially homogeneous spatial relationship to the at least one modeling set, and
> dividing such that the training set comprises a substantially separate spatial relationship to the at least one modeling set; (Portion of Applicants' Independent Claim 7).

Therefore, Applicants respectfully request that the rejection of independent claim 7, and claims 10 through 15 depending therefrom, be withdrawn.

Furthermore regarding Claim 7 and specifically regarding Applicants' element of a "**a data generation and manipulation module for loading a data set from the one or more spatial databases based on designated attributes, wherein the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface,**" the Office Action, at page 9, alleges that Busche does not explicitly disclose

> a data generation and manipulation module for loading a the data set from the one or more spatial databases based on designated attributes, wherein the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface;" Kohavi discloses a data generation and manipulation module for loading a the data set from the one or more spatial databases based on designated attributes, wherein the attributes are selected and supplied to the data generation and manipulation module by a s user through the user interface (col 4, lines 35-40, 60-65; col 6, lines 55-62).

Applicants respectfully disagree about the characterization of the teaching of Kohavi. For clarity, Applicants have reprinted the specific citations to the references below to highlight that such claim elements are not disclosed by Kohavi as alleged by the Examiner. Specifically, Kohavi teaches at the cited references:

> Furthermore, additional important attributes are determined given one or more important attributes. In other words, one or more attributes that are considered important are pre-selected. The method then determines additional important attributes and adds them to the pre-selected important attributes. (Col.

7, lines 10-15).

> The present invention can be used to define a data set used to generate a splat visualization. For example, see U.S. patent application entitled "Method, System and Computer Program Product for Visually Approximating Scattered Data," application Ser. No. 08/782,809, filed on Jan. 13, 1997, and incorporated herein by reference in its entirety. (Col. 4, lines 60-65).

> In a step 108, the label attribute is chosen. In a step 112, one or more first attributes that the user considers important are chosen. The first important attributes may include empty set of attributes (i.e., no attributes). In a step 116, one or more second important attributes are generated. The second important attributes together with the user chosen first important attributes best discriminate between the different values of the label attribute. In a step 120, non-cumulative purity of each first . and second important attribute is generated." (Col. 6, lines 55-62).

Applicants respectfully point out that nothing within Kohavi, as cited by the Examiner, discusses the specific element of Applicants' invention, namely:

> a data generation and manipulation module for loading a data set from the one or more spatial databases based on designated attributes, wherein the attributes are selected and supplied to the data generation and manipulation module by a user through the user interface, (Portion of Applicants' Independent Claim 7).

Applicants' claim element generally recites loading a data set from one or more databases based upon designated attributes. The data set becomes a subset of the data within the database(s) with the data set then being manipulated according to the other elements of the claim. In distinct contrast, Kohavi analyzes the entire database based on a selected attribute and then selects another attribute in order to determine the orthogonality ("non-cumulative purity") of the attributes. The attributes of Kohavi do not result in a data set that is a subset of the data in the database(s). Therefore, Applicants respectfully request that the rejection of independent claim 7, and claims 10 through 15 depending therefrom, be withdrawn.

Obviousness Rejection Based on U.S. Patent No. 6,430,547 to Busche et al. and U.S. Patent No. 6,236,907 to Hauwiller et al. in view of U.S. Patent No. 6,026,399 to Kohavi et al.

Claims 1 through 6, 12 through 14, and 16 through 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Busche et al. (U.S. Patent No. 6,430,547) and Hauwiller et al. (U.S. Patent No. 6,236,907) in view of Kohavi et al. (U.S. Patent No. 6,026,399). Applicants respectfully traverse this rejection, as hereinafter set forth.

> M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:
>
> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 1 through 6, 12 through 14, and 16 through 25 are improper because the elements for a prima facie case of obviousness are not met. Specifically, the rejection fails to meet the criterion that the prior art references must teach or suggest all the claim limitations.

Claims 1 through 6

Regarding Applicants' **"act of partitioning the spatial data"**, the Office Action alleges that:

> Busche discloses a system including spatial data for a spatial environment (Fig 4; col 2, lines 19-21). **Busche further discloses an act of partitioning the spatial data into a training set and at least one modeling set** wherein the act of partitioning is selected from the group consisting of: **selecting the training set such that the training set comprises a substantially homogenous spatial relationship** to the at least one modeling set, and **selecting the training set such that the training set comprises a substantially separate spatial relationship** to

the at least one modeling set (**col 7, lines 15-50; col 10, lines 40-55**). (Office Action p. 11; Emphasis added).

Applicants respectfully disagree about the characterization of the teaching of Busche. For clarity, Applicants have reprinted the specific citations to the references below to highlight that such claim elements are not disclosed by Busche as alleged by the Examiner. Specifically, Busche teaches at the cited references:

> This technique does not discover any new rules, but it does provide an explanation for the classification, namely the values of the closest neighbors.
>
> The final technique examined is neural nets. A typical neural net includes an input layer of neurons corresponding to the predicting attributes, a hidden layer of neurons, and an output layer of neurons that are the result of the classification. For example, there may be eight input neurons corresponding to "under 0.25% concentration", "between 0.25% and 0.45% concentration", "over 0.45% concentration", "from Carlin, Nev.", "from shale above the deposit", "from shale below the deposit", and "from the gold bearing organic material within the deposit". There could be two output neurons: "has chemical signature A" and "does not have chemical signature A". A reasonable number of neurons in the middle layer is determined by experimenting with a particular known data set. There are interconnections between the neurons at adjacent layers that have numeric weights. When the network is trained, meaning that both the input and output values are known, these weights are adjusted to given the best performance for the training data. The "knowledge" is very low level (the weight values) and is distributed across the network. This means that neural nets do not provide any comprehensible explanation for their classification behavior-they simply provide a predicted result. Neural nets may take a very long time to train, even when the data is deterministic. For example, to train a neural net to recognize an exclusive-or relationship between two Boolean variables may take hundreds or thousands of training data (the four possible combinations of inputs and corresponding outputs repeated again and again) before the neural net learns the circuit correctly. However, once a neural net is trained, it is very robust and resilient to noise in the data. Neural nets have proved most useful for pattern recognition tasks, such as recognizing handwritten digits in a zip code. (Col. 7, lines 15-50).

> . . . because no veins of that type had been seen in these rocks in the past.
>
> Spatial analysis allows for the relative locations of these data to be addressed. An oil company may collect significant amounts of data using a variety of well-logging instruments in which a well is drilled, an instrument is lowered into the well, and the instrument is slowly pulled to the surface while data is collected from the instrument. The company may collect data throughout a region by drilling several wells in a region. With a scarcity of data in certain subregions,

> a modeling tool provides some predictive capability to the known values by creating intermediate values. Using different types of spatial analysis techniques, values between the wells may be predicted, and a three-dimensional model of the region that shows various characteristics in the data may then be constructed in order to predict unknown values between the known values. (Col. 10, lines 40-55).

Applicants respectfully point out that nothing within Busche, as cited by the Examiner, discusses the specific step of Applicants' invention, namely:

> an act of partitioning the spatial data into a training set and at least one modeling set wherein the act of partitioning is selected from the group consisting of:
> selecting the training set such that the training set comprises a substantially homogenous spatial relationship to the at least one modeling set, and
> selecting the training set such that the training set comprises a substantially separate spatial relationship to the at least one modeling set;
> (Portion of Applicants' Independent Claim 1).

Therefore, Applicants respectfully request that the rejection of independent claim 1, and claims 2 through 6 depending therefrom, be withdrawn.

Regarding Applicants' **"act of inspecting the generated data set"**, the Office Action alleges that:

> **Busche discloses . . . an act of inspecting the generated data set to provide statistical information for the data set (col 4, lines 53-55)**; (Office Action p. 11; Emphasis added).

Applicants respectfully disagree about the characterization of the teaching of Busche. For clarity, Applicants have reprinted the specific citations to the references below to highlight that such claim elements are not disclosed by Busche as alleged by the examiner. Specifically, Busche teaches at the cited reference:

> . . . intelligence, and parallel/distributed computing.
> Data mining may be categorized into several tasks, such as association, classification, and clustering. (Col. 4, lines 53-55).

Applicants respectfully point out that nothing within Busche, as cited by the Examiner, discusses the specific step of Applicants' invention, namely:

> an act of inspecting the generated data set to provide statistical information for the data set; (Portion of Applicants' Independent Claim 1).

Therefore, Applicants respectfully request that the rejection of independent claim 1, and claims 2 through 6 depending therefrom, be withdrawn.

Claims 12 through 14

The Office Action rejects claims 12 through 14 by sustaining the rejections above with reference to claim 7 and further relies upon Hauwiller for disclosure relating to the "recommendation module." Applicants herein sustain the above-arguments regarding the lack of disclosure and teaching relating to claim 7 from which claims 12 through 14 depend. Therefore, Applicants respectfully submit that neither Busche, Kohavi nor Hauwiller, either individually or in any proper combination, teach, suggest or motivate Applicants' invention as claimed. Applicants respectfully request that the rejections based thereon be withdrawn.

Claims 16 through 25

The Office Action alleges that:

> Busche discloses a system a networked computer system that includes a client and a server (col 3, lines 24-26), wherein the server maintains spatial data set (Fig 4, col 2, lines 19-21; col 6, lines 10-15), a method for analyzing the spatial data sets over the network (col 10, lines 15-18), the method comprising the steps for: classifying the spatial data sets into predetermined classes (col 8, lines 58-62).
>
> Busche does not explicitly disclose "applying spatial data mining functions to the spatial data sets, the spatial data sets generated using identified attributes selected by a user, wherein said spatial data mining functions comprise the steps for modeling the spatial data sets to provide estimation of predetermined parameters at predetermined points; and using the estimation of the predetermined

parameter to accomplish a predetermined purpose, wherein the predetermined purpose includes at least one of determining how the predicted variable affects a predetermined target variable, providing recommendations as to how to achieve a predetermined target variable, and creating new spatial data mining methods."

Hauwiller discloses using an expert system (data mining system) to generate application maps based on field data and the relationship to the desired output (col 4, lines 36-40). The system further generates treatment reports in addition to the applications maps (col 4, lines 48-52). Hauwiller further states that user instructions are used to determine what information is retrieved when generating the reports and maps (col 4, lines 23-26) and the instructions are entered using a user interface (col 1, lines 65-67; col 4, lines 5-35).

Busche in view of Hauwiller do not explicitly disclose, "the spatial data sets generated using identified attributes selected by a user".

Kohavi discloses the spatial data sets generated using identified attributes selected by a user (col 4, lines 60-65).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ the user-attributes selection, pre-processing and statistical analysis disclosed by Busche and Kohavi in Hauwiller's system. One of ordinary skill in the art would have been motivated to do this because it would allow the user to determine optimum fertilization levels (col 1, lines 35-40). Office Action pp. 13-14).

Applicants respectfully disagree about the characterization of the teaching of Busche, Huawiller and Kohavi. Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference and the Kohavi reference does not and cannot establish a prima facie case of obviousness under 35 U.S.C. § 103(a) regarding the presently claimed invention of independent claim 16 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Applicants submit that any proposed combination of the Busche reference, the Hauwiller reference and the Kohavi reference does not teach or suggest portions of the claim limitations calling for "using the estimation of the predetermined parameter to accomplish a predetermined purpose, wherein the predetermined purpose includes at least one of determining how the predicted variable affects a predetermined target variable, **providing recommendations as to how to achieve a predetermined target variable, and creating new spatial data mining methods**."

The Office action addresses the predetermined purpose of determining how the predicted variable affects a predetermined target variable. However, Applicants do not see that the cited references (namely Hauwiller col. 4, lines 36-40, lines 48-52, lines 23-26, and lines 5-35) supporting the rejection of this element of claim 16 address the other predetermined purposes of "providing recommendations as to how to achieve a predetermined target variable."

Applicants submit that a prior art reference must be considered as a whole including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 USPQ 303 (Fed. Cir. 1983). Hauwiller teaches, "recommendation equations or application rate equations are formulas which express the relationship between existing field conditions and desired output. The expert system 216 may utilize pre-defined recommendation equations as illustrated by block 226 or user specified recommendations as indicated by block 208b for correlating desired data relative to desired output" (col. 9, lines 16-22). Both "pre-defined recommendation equations" and "user specified recommendations" suggests *a priori* development of the recommendations. As a result, Hauwiller would suggest against, or at least lead away from, "using the estimation of predetermined parameters to . . . provide recommendations as to how to achieve a predetermined target variable." In other words, the prior art suggests using pre-defined recommendations rather than the present inventions claim of generating recommendations as to how to achieve a target variable as part of the result of the spatial data mining process.

Additionally, Applicants can find nothing in the cited references of Hauwiller, Busche, or Kohavi, teaching, "using the estimation of the predetermined parameter to accomplish a predetermined purpose, wherein the predetermined purpose includes at least one of determining how the predicted variable affects a predetermined target value . . .."

For these reasons, claim 16 and claim 22 depending from claim 16 are clearly allowable over the cited prior art of the Busche reference in view of the Hauwiller reference, and the Kohavi reference under 35 U.S.C. § 103. As a result, Applicants respectfully request that the rejections to claims 16, and claims 17-22 depending therefrom, be withdrawn.

Claim 23

As with claim 16, Applicants submit that any proposed combination of the Busche reference in view of the Hauwiller reference does not and cannot establish a prima facie case of obviousness under 35 U.S.C. § 103(a) regarding the presently claimed invention of independent claim 23 because, at the very least, the cited prior art does not teach or suggest all the claim limitation of the presently claimed invention as set forth hereinabove. Claim 23 contains the element of "using the estimation of the spatial data analysis to optimize the treatment of the agricultural field to produce a predetermined yield". Applicants herein sustain their above-arguments relating to lack of disclosure and leading away by Busche and Hauwiller with regard to this element.

Therefore, Applicants submit that neither Busche nor Hauwiller, either individually or in any proper combination teach, suggest or motivate Applicants' invention as claimed in independent claim 23. Applicants respectfully request that rejection to claim 23, and claims 24-25 depending therefrom, be withdrawn.

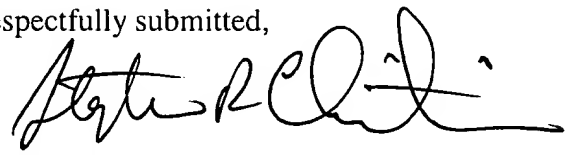
ENTRY OF AMENDMENTS

The amendments to claims 1, 7, 16 and 23 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search.

CONCLUSION

Claims 1 through 7, and 10 through 25 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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Date: 8 APR 2004